



6560-50-P

**ENVIRONMENTAL PROTECTION AGENCY**

**40 CFR Part 51**

**[EPA-HQ-OAR-2010-0605; FRL-9900-53-OAR]**

**RIN 2060-AR70**

**Air Quality: Revision to Definition of Volatile Organic Compounds – Exclusion of 2,3,3,3-tetrafluoropropene**

**AGENCY:** Environmental Protection Agency (EPA).

**ACTION:** Final rule.

**SUMMARY:** The EPA is taking final action to revise the regulatory definition of volatile organic compounds (VOCs) for purposes of preparing state implementation plans (SIPs) to attain the national ambient air quality standards (NAAQS) for ozone under title I of the Clean Air Act (CAA). This final action adds 2,3,3,3-tetrafluoropropene (also known as HFO-1234yf) to the list of compounds excluded from the regulatory definition of VOCs on the basis that this compound makes a negligible contribution to tropospheric ozone formation. As a result, if you are subject to certain federal regulations limiting emissions of VOCs, your emissions of HFO-1234yf may not be regulated for some purposes. This action may also affect whether HFO-1234yf is considered a VOC for state regulatory purposes, depending on whether the state relies on the EPA's regulatory definition of VOCs.

**DATES:** This rule is effective on **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**.

**ADDRESSES:** The EPA has established a docket for this action under Docket ID No. EPA-HQ-OAR-2010-0605. All documents in the docket are listed on the

*www.regulations.gov* website. Although listed in the index, some information is not publicly available, i.e., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, will be publicly available only in hard copy. Publicly available docket materials are available either electronically in *www.regulations.gov* or in hard copy at the Docket ID No. EPA-HQ-OAR-2010-0605, EPA/DC, EPA West, Room 3334, 1301 Constitution Avenue, Northwest, Washington, D.C. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744 and the telephone number for the Air and Radiation Docket Information Center is (202) 566-1742. For additional information about the EPA's public docket, visit the EPA Docket Center homepage at:

*<http://www.epa.gov/epahome/dockets.htm>.*

**FOR FURTHER INFORMATION CONTACT:** David Sanders, Office of Air Quality Planning and Standards, Air Quality Policy Division, Mail Code C539-01, Research Triangle Park, NC 27711; telephone: (919) 541-3356; fax number: 919-541-0824; email address: *sanders.dave@epa.gov*.

## **SUPPLEMENTARY INFORMATION:**

### **I. General Information**

#### *A. Does this action apply to me?*

Entities potentially affected by this final rule include, but are not necessarily limited to, states (typically state air pollution control agencies) that control VOCs; manufacturers, importers or processors of this compound; and industries involved in the manufacture or servicing of automobiles or automotive air conditioning systems. This

action has no substantial direct effects on industry because it does not impose any new mandates on these entities, but, to the contrary, removes HFO-1234yf from the regulatory definition of VOCs. The use of this compound is subject to restrictions under the CAA and the Toxic Substances Control Act (TSCA). Specifically, the use of this compound as an aerosol propellant, blowing agent, or refrigerant, or any other use in which it would substitute for chlorofluorocarbons, hydrochlorofluorocarbons or their substitutes, is prohibited unless such use has been approved under the Significant New Alternatives Policy (SNAP) program (CAA §612; 40 CFR 82 subpart G). The SNAP program has issued a final approval for HFO-1234yf only as a substitute for use in the motor vehicle air conditioning end-use as a replacement for ozone depleting substances (76 FR 17488, March 29, 2011; revised at 77 FR 17344, March 26, 2012). Furthermore, any significant new use of HFO-1234yf is subject to a reporting requirement according to a significant new use rule (SNUR) established under TSCA (75 FR 65987, October 27, 2010; proposed for amendment at 78 FR 32617, May 31, 2013).

*B. How is this preamble organized?*

The information presented in this preamble is organized as follows:

I. General Information

- A. Does this action apply to me?
- B. How is this preamble organized?

II. Background

- A. The EPA's VOC Exemption Policy
- B. Petition to list HFO-1234yf as an Exempt Compound
- C. Contribution to Tropospheric Ozone
- D. Health and Environmental Risks

III. Proposed Action and Response to Comments

IV. Final Action

V. Statutory and Executive Order Reviews

- A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review

- B. Paperwork Reduction Act
- C. Regulatory Flexibility Act
- D. Unfunded Mandates Reform Act
- E. Executive Order 13132: Federalism
- F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments
- G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks
- H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution, or Use
- I. National Technology Transfer and Advancement Act
- J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
- K. Congressional Review Act
- L. Judicial Review

## **II. Background**

### *A. The EPA's VOC Exemption Policy*

Tropospheric ozone, commonly known as smog, is formed when VOCs and nitrogen oxides (NO<sub>x</sub>) react in the atmosphere in the presence of sunlight. Because of the harmful health effects of ozone, the EPA and state governments limit the amount of VOCs that can be released into the atmosphere. VOCs are those organic compounds of carbon that form ozone through atmospheric photochemical reactions. Different VOCs have different levels of reactivity. That is, they do not react to form ozone at the same speed or do not form ozone to the same extent. Some VOCs react slowly or form less ozone; therefore, changes in their emissions have less and, in some cases, very limited effects on local or regional ozone pollution episodes. It has been the EPA's policy that organic compounds with a negligible level of reactivity should be excluded from the regulatory definition of VOCs so as to focus VOC control efforts on compounds that do significantly increase ozone concentrations. The EPA also believes that exempting such compounds creates an incentive for industry to use negligibly reactive compounds in

place of more highly reactive compounds that are regulated as VOCs. The EPA lists compounds that it has determined to be negligibly reactive in its regulations as being excluded from the regulatory definition of VOCs (40 CFR 51.100(s)).

Section 302(s) of the CAA specifies that the EPA has the authority to define the meaning of “VOC,” and hence what compounds shall be treated as VOCs for regulatory purposes. The policy of excluding negligibly reactive compounds from the regulatory definition of VOCs was first set forth in the “Recommended Policy on Control of Volatile Organic Compounds” (42 FR 35314, July 8, 1977) and was supplemented most recently with the “Interim Guidance on Control of Volatile Organic Compounds in Ozone State Implementation Plans” (Interim Guidance) (70 FR 54046, September 13, 2005). The EPA uses the reactivity of ethane as the threshold for determining whether a compound has negligible reactivity. Compounds that are less reactive than, or equally reactive to, ethane under certain assumed conditions may be deemed negligibly reactive and therefore suitable for exemption from the regulatory definition of VOCs. Compounds that are more reactive than ethane continue to be considered VOCs for regulatory purposes and therefore are subject to control requirements. The selection of ethane as the threshold compound was based on a series of smog chamber experiments that underlay the 1977 policy.

The EPA has used three different metrics to compare the reactivity of a specific compound to that of ethane: (i) the reaction rate constant (known as  $k_{OH}$ ) with the hydroxyl radical (OH); (ii) the maximum incremental reactivity (MIR) on a reactivity per unit mass basis; and (iii) the MIR expressed on a reactivity per mole basis. If a compound is equally or less reactive than ethane on any one of these three metrics, then under the

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Interim Guidance it is considered by the EPA to be negligibly reactive in forming ozone.

A full description of each metric and how it is derived can be found in the proposal notice for this action (76 FR 64059, October 17, 2011) and is not repeated here.

*B. Petition to list HFO-1234yf as an Exempt Compound*

Honeywell Inc. submitted a petition to the EPA on June 29, 2009, requesting that HFO-1234yf (CAS 754-12-1) be exempted from VOC control based on its low reactivity relative to ethane. The petitioner indicated that HFO-1234yf may be used as a refrigerant for refrigeration and air-conditioning. Honeywell also indicated that it expects HFO-1234yf to be widely used as a replacement for HFC-134a in motor vehicle air-conditioners (MVAC), and that it has been specifically developed for this purpose.

Honeywell asserts that as a replacement for use in motor vehicle air conditioners, there will be an environmental advantage in that the global warming potential (GWP) of HFO-1234yf is 4, which is substantially lower than the GWP for HFC-134a (100-year GWP = 1430), which HFO-1234yf is designed to replace.

*C. Contribution to Tropospheric Ozone*

Detailed information on the ozone reactivity of HFO-1234yf was presented in the proposal notice for this action (76 FR 64059, October 17, 2011) and is summarized here.

HFO-1234yf has a higher  $k_{OH}$  value than ethane, meaning that it initially reacts more quickly in the atmosphere than ethane. A molecule of HFO-1234yf is also more reactive than a molecule of ethane. However, a gram of HFO-1234yf has the same reactivity as a gram of ethane.

Under the Interim Guidance, if a compound is equally or less reactive than ethane on any one or more of the three reactivity metrics, it is considered by the EPA to be

negligibly reactive in forming ozone. The data submitted by Honeywell support the conclusion that the reactivity of HFO-1234yf is equal to or lower than that of ethane on a mass MIR basis. Thus, HFO-1234yf is eligible for exemption from the regulatory definition of VOCs under the terms of the Interim Guidance.

The EPA has also considered the results of a recent peer-reviewed study of the increase in ozone that may occur as a result of the substitution of HFO-1234yf for HFC-134a.<sup>1</sup> The additional information from this study shows that, under the assumptions used in the air quality modeling, the use of HFO-1234yf would produce slightly more ozone than continued use of HFC-134a, but the increase is unlikely to have a significant impact on local air quality. The EPA believes the very small increase (0.01 percent) in ozone concentrations that may result from encouraging the use of HFO-1234yf via an exemption from the regulatory definition of VOC does not constitute a sufficient reason to depart from the Interim Guidance's reliance on MIR comparisons to ethane as the basis for approving VOC exemption requests.

In summary, the EPA believes that this chemical qualifies as negligibly reactive with respect to its contribution to tropospheric ozone formation.

#### *D. Health and Environmental Risks*

The preamble to the proposal notice for this action (76 FR 64059, October 17, 2011) provided background information on the Premanufacture Notice (PMN) and SNAP reviews of HFO-1234yf. This information is summarized and updated here.

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<sup>1</sup> D. Luecken, R. Waterland, S. Papasavva, K. Taddonio, W. Hutzell, J. Rugh, and S. Andersen. Ozone and TFA Impacts in North America from Degradation of 2,3,3,3-Tetrafluoropropene (HFO-1234yf), A Potential Greenhouse Gas Replacement. *Environ. Sci. Technol.* 44, pp. 343-349. *See* 76 FR 64059 (October 17, 2011). *See* 76 FR 64059 (October 17, 2011) at 64062 for additional description of this study and the EPA's assessment of it.

After reviewing available information and public comments regarding its safety, health and environmental risks and benefits under the SNAP program, the EPA issued a final listing on March 29, 2011, for HFO-1234yf as an acceptable substitute for use of ozone depleting substances in MVAC, subject to specific use conditions, in place of CFC-12 and HFC-134a (76 FR 174888).<sup>2</sup>

In the SNAP review, the EPA found that the use of HFO-1234yf in new passenger vehicle and light-duty truck MVAC systems, subject to the use conditions, does not present a significantly greater risk to human health and the environment compared to the currently approved MVAC alternatives. The 2011 SNAP rule for HFO-1234yf was amended on March 26, 2012, to incorporate by reference a revised standard for connecting fittings from SAE International (77 FR 17344).

Under the TSCA, the EPA in 2010 completed a pre-manufacture review for HFO-1234yf and issued a SNUR (75 FR 65987, October 27, 2010). The 2010 SNUR for HFO-1234yf requires significant new use notification to the EPA at least 90 days before manufacturing or processing for uses beyond air conditioning in new passenger cars and vehicles or commercial servicing of new passenger cars and vehicles originally designed for HFO-1234yf. In particular, under the 2010 rule, notification is required before HFO-1234yf can be sold directly to consumers for the purpose of servicing the MVAC system of their own vehicles. During the notification period, the EPA can take further action to prevent any unreasonable risk. This precautionary step was taken because of certain animal exposure studies indicating toxicity, and the possibility that consumers might be exposed to levels of HFO-1234yf that would cause an unreasonable health risk. However,

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<sup>2</sup>HFC-134a, which is not an ozone depleting substance, has already largely replaced CFC-12 in motor vehicle air conditioners.



based on information submitted subsequent to the 2010 rule that in the EPA's view resolves the issue pertaining to the potential risks from consumer exposure that was present in 2010, the EPA has proposed to amend the SNUR for HFO-1234yf such that notification would not be required prior to sale of HFO-1234yf-containing consumer products used to recharge the MVAC systems in passenger cars and vehicles originally designed for HFO-1234yf (78 FR 32617, May 31, 2013).

### **III. Proposed Action and Response to Comments**

Based on the mass MIR value for HFO-1234yf being equal to or less than that of ethane, the EPA proposed to find that HFO-1234yf is "negligibly reactive" and to exempt HFO-1234yf from the regulatory definition of VOCs at 40 CFR 51.100(s) (76 FR 64059, October 17, 2011).<sup>3</sup>

There were two comments regarding HFO-1234yf submitted to the docket during the public comment period. One comment was from the petitioner, Honeywell. Another comment came from the Alliance of Automobile Manufacturers. Both comments were in favor of exempting HFO-1234yf. The EPA acknowledges the commenters' support for the proposed action.

### **IV. Final Action**

The EPA is taking final action to approve the petition for exemption of HFO-1234yf from the regulatory definition of VOCs.

If an entity uses or produces HFO-1234yf and is subject to the EPA regulations limiting the use of VOC in a product other than an aerosol coating, limiting the VOC

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<sup>3</sup> In this proposal, we also proposed to exempt *trans*-1,3,3,3-tetrafluoropropene (also known as HFO-1234ze) from the definition of VOC. We have taken final action separately for HFO-1234ze on that proposal. 77 FR 37610, June 22, 2012.

emissions from a facility, or otherwise controlling the use of VOC for purposes related to attaining the ozone NAAQS, then the compound will not be counted as a VOC in determining whether these regulatory obligations have been met. Emissions of this compound will not be considered in determining whether a proposed new or modified source triggers the applicability of Prevention of Significant Deterioration (PSD) requirements, in areas where the PSD program is implemented by the EPA or a delegated state, local or tribal agency. This action may also affect whether HFO-1234yf is considered a VOC for state regulatory purposes to reduce ozone formation, depending on whether a state relies on the EPA's regulatory definition of VOCs. States are not obligated to exclude from control as VOCs those compounds that the EPA has found to be negligibly reactive. However, states may not take credit for controlling these compounds in their ozone control strategies.

This action is consistent with the Interim Guidance in that one of the three reactivity metric values for HFO-1234yf compares favorably to the corresponding value for ethane. This action is also supported by the EPA's finding during PMN review that HFO-1234yf did not present an unreasonable risk to human health or the environment from the expected uses of the substance, our finding in the SNAP program review of this chemical that use of this chemical in currently-allowed applications poses lower or comparable overall risk to human health and the environment than other acceptable options for the same uses and our confidence that the SNAP program, and the requirements under TSCA will prevent the use of this chemical in any additional applications where such use would pose a significant risk to human health or the environment.

## **V. Statutory and Executive Order Reviews**

### *A. Executive Order 12866: Regulatory Planning and Review and Executive Order 13563: Improving Regulation and Regulatory Review*

This action is not a "significant regulatory action" under the terms of Executive Order 12866 (58 FR 51735, October 4, 1993) and is therefore not subject to review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011).

### *B. Paperwork Reduction Act*

This action does not impose an information collection burden under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* Burden is defined at 5 CFR 1320.3(b). It does not contain any recordkeeping or reporting requirement.

### *C. Regulatory Flexibility Act*

The Regulatory Flexibility Act (RFA) generally requires an agency to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agency certifies that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations and small governmental jurisdictions.

For purposes of assessing the impacts of this action on small entities, small entity is defined as: (1) a small business as defined by the Small Business Administration (SBA) regulation (see 13 CFR 121.201); (2) a small governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

After considering the economic impacts of today's final rule on small entities, I certify that this action will not have a significant economic impact on a substantial number of small entities. In determining whether a rule has a significant economic impact on a substantial number of small entities, the impact of concern is any significant adverse economic impact on small entities, since the primary purpose of the regulatory flexibility analyses is to identify and address regulatory alternatives "which minimize any significant economic impact of the rule on small entities." 5 USC 603 and 604. Thus, an agency may certify that a rule will not have a significant economic impact on a substantial number of small entities if the rule relieves regulatory burden, or otherwise has a positive economic effect on all of the small entities subject to the rule. This final rule removes HFO-1234yf from the regulatory definition of VOCs and thereby relieves users from requirements to control emissions of the compound. We have, therefore, concluded that today's final rule will relieve regulatory burden for all affected small entities.

#### *D. Unfunded Mandates Reform Act*

This action contains no federal mandates under the provisions of Title II of the Unfunded Mandates Reform Act of 1995 (UMRA), 2 U.S.C. 1531-1538 for state, local or tribal governments or the private sector. The action imposes no enforceable duty on any state, local or tribal governments or the private sector. Therefore, this action is not subject to the requirements of sections 202 and 205 of the UMRA.

This action is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. This final rule removes HFO-1234yf from the regulatory definition

of VOCs and thereby relieves users of the compound from requirements to control emissions of the compound.

*E. Executive Order 13132: Federalism*

This action does not have federalism implications. It will not have substantial direct effects on the states, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, as specified in Executive Order 13132. This final rule removes HFO-1234yf from the regulatory definition of VOCs and thereby relieves users from requirements to control emissions of the compound. Thus, Executive Order 13132 does not apply to this rule.

*F. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments*

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). It would not have substantial direct effects on tribal governments, on the relationship between the federal government and Indian Tribes, or on the distribution of power and responsibilities between the federal government and Indian Tribes, as specified in Executive Order 13175. Thus, Executive Order 13175 does not apply to this rule.

*G. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks*

This action is not subject to EO 13045 (62 FR 19885, April 23, 1997) because it is not economically significant as defined in EO 12866. While this final rule is not subject to the Executive Order, the EPA has reason to believe that ozone has a disproportionate

effect on active children who play outdoors (62 FR 38856; 38859, July 18, 1997). The EPA has not identified any specific studies on whether or to what extent HFO-1234yf may affect children's health.

*H. Executive Order 13211: Actions that Significantly Affect Energy Supply, Distribution or Use*

This action is not subject to Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not a significant regulatory action under Executive Order 12866.

*I. National Technology Transfer and Advancement Act*

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law 104-113, section 12(d), (15 U.S.C. 272 note) directs the EPA to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures and business practices) that are developed or adopted by voluntary consensus standards bodies. The NTTAA directs the EPA to provide Congress, through OMB, explanations when the agency decides not to use available and applicable voluntary consensus standards. This rulemaking does not involve technical standards. Therefore, the EPA has not considered the use of any voluntary consensus standards.

*J. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

Executive Order (EO) 12898 (59 FR 7629, February 16, 1994) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part

of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies and activities on minority populations and low-income populations in the United States.

The EPA has determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income populations because it will not affect the level of protection provided to human health or the environment.

#### *K. Congressional Review Act*

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. The EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives and the Comptroller General of the United States prior to publication of the rule in the *Federal Register*. A major rule cannot take effect until 60 days after it is published in the *Federal Register*. This action is not a “major rule” as defined by 5 U.S.C. 804(2). This rule will be effective on **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE *FEDERAL REGISTER*]**.

#### *L. Judicial Review*

Under section 307(b)(1) of the CAA, petitions for judicial review of this action must be filed in the United States Court of Appeals for the District of Columbia Circuit Court within 60 days from the date the final action is published in the *Federal Register*.

Filing a petition for review by the Administrator of this final action does not affect the finality of this action for the purposes of judicial review nor does it extend the time within which a petition for judicial review must be final, and shall not postpone the effectiveness of such action. Thus, any petitions for review of this action related to the exemption of HFO-1234yf from the regulatory definition of VOCs must be filed in the Court of Appeals for the District of Columbia Circuit within 60 days from the date final action is published in the *Federal Register*.

List of Subjects in 40 CFR Part 51

Environmental protection, Administrative practice and procedure, Air pollution control, Ozone, Reporting and recordkeeping requirements, Volatile organic compounds.

Dated: September 19, 2013.

Gina McCarthy,  
EPA Administrator.



For reasons set forth in the preamble, part 51 of chapter I of title 40 of the Code of Federal Regulations is amended as follows:

PART 51-REQUIREMENTS FOR PREPARATION, ADOPTION, AND SUBMITTAL OF  
IMPLEMENTATION PLANS

Subpart F – [Amended]

1. The authority citation for Part 51, Subpart F, continues to read as follows:

Authority: 42 U.S.C. 7401, 7411, 7412, 7413, 7414, 7470-7479, 7501-7508, 7601, and 7602.

§ 51.100 – [Amended]

2. Section 51.100 is amended at the end of paragraph (s)(1) introductory text by removing the words “and perfluorocarbon compounds which fall into these classes:” and adding in their place the words “2,3,3,3-tetrafluoropropene; and perfluorocarbon compounds which fall into these classes:”.

[FR Doc. 2013-23783 Filed 10/21/2013 at 8:45 am; Publication Date: 10/22/2013]